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THE
DIARY COMPANION,
BEING A
SUPPLEMENT
TO THE
LADIES' DIARY,
FOR THE YEAR 1792.

Containing Answers to the last Year's ENIGMAS, REBUSES, CHARADES, QUERIES, and QUESTIONS; both in the DIARY and SUPPLEMENT.

With some New ENIGMAS, REBUSES, CHARADES, QUERIES, and QUESTIONS, proposed to be answered next Year.

Also, CALCULATIONS of the ECLIPSES; with a Continuation of the Account of New Comets, and other New Discoveries in the Heavens.

By the DIARY AUTHOR.

Printed for G. G. J. and J. ROBINSON, Paternoster-Row, 1792.

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S U P P L E M E N T
T O T H E
L A D I E S' D I A R Y,
F O R T H E Y E A R 1792.

ANSWERS TO THE PRIZE ENIGMA, *A Frown.*

10. *Ode to Fortitude, by Mr. R. T. of Liverpool.*

I.

Whatever wealth, or pow'r, or state
In life, to man's ordain'd by fate—
Whether in pleasure's affluent sphere to move,
Or dwell, with toil for food, beneath the lowly cot,
He must the wounds of disappointment prove;
Against the pangs of care, of frustrate hope, contend,
Anxieties and loss; that on mankind attend.

Oh! when those mortal ills that wait my future lot,
At Fortune's *Frown* shall on my spirits fall,
Do thou, blest Fortitude, regard my call.

II.

Oh! grant thy daughters, meek and fair,
Unto my aid, when griev'd, repair—
Should it befall of poverty to bear
The painful wants, let sweet content my need beguile—
Should sprightly health, than riches still more dear,
My youth forsake, and sickness, languid, dull, and pale,
With ghastly tyranny severe my frame assail,
May meek-eyed Patience with my pains and suff'rings smile.
And when ensues, which nature shrinks at, death,
May Resignation breathe,—my parting breath—
Thy patroness (fair Virtue) to my breast
Shall be with fond anxiety carefs'd.

11. *Lintoniensis' Invitation to a Friend, on his Birth-Day,*

From all the toil of business free,
Come pass, my friend, this day with me.
I dedicate the whole to joy,
Let friendship then each hour employ.
In jovial song we'll jocund join,
And freely sip the sparkling wine.
But far from us be Bacchus' train,
I hate their jests and talk profane.

No—nought should hurt her eye or ear,
Were Temperance self in person here.

In life so chequer'd here below,
Few men but meet their share of woe:
Ours has been large—but we'll forget
To-day what heretofore we've met;
Nor think on future grief or care,
The *Frowns* of fortune or the fair.
If cares should rise with morrow's sun,
We'll do as heretofore we've done.
But come—in cheerful mirth and glee
To pass, my friend, this day with me.

12. *A Sonnet, by Mr. Tho. Woolston, Master of the Boarding School at Adderbury, Oxfordshire.*

Regardless of the muse I wander'd long,
Oppress'd by pain and ever-frowning care;
But now, as brightens up the prospect fair,
Again I seek the pleasing charms of song.
For, oh! how cheering health's returning smile!
Weak mortals best enjoyment here below;
Still round my dwelling may its blessings flow,
For these can best old Care's dark *Frowns* beguile.

Grateful before heaven's mercy-seat I bend,
To offer up sincere my thanks and praise
To my almighty Father, heavenly Friend,
Whose bounteous goodness lengthens out my days.
O that my muse could raise such strains of love,
As might accord with angels' songs above.

13. *Virtue Triumphant; by Miss Louisa Amelia Harpur, of Bristol.*

A *Frown* the tyrant's stern decree proclaims;
And *Frowns* have chill'd the hearts of love-fraught swains.
Sometimes a *Frown* can check the bold and rude;
And oft by *Frowns* is gentle worth subdued.
Yet tho' fell cares molest, and Fortune frown,
Bright Virtue sits triumphant on her throne;
Or rais'd by faith she soars beyond the skies,
And all the *Frowns* of wayward fate defies.

14. *Country Life: by Mr. Olinthus Gregory, of Tuxley.*

Remote from folly, noise, and strife,
How happy is a country life!
We envy not the rich nor great,
We live content, though not in state;

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With friends and neighbours spend the night,
And cheerful rise at dawn of light :
Tho' Fortune *Frowns* upon us here,
We happy live throughout the year.

15. *The Lot of Man: by Vertigo.*

Oppress'd by chilling penury or pain,
How many sigh the tedious hours away,
Drooping beneath the sun's all-cheering ray,
And can no comfort to their mind obtain !—
Oh ! who unmov'd without dismay can bear
The *Frown* of adverse fortune when severe !
Surely, O man, to misery thou art born !
To-day, elate with joy, thou smil'st serene ;
To-morrow comes, and changes the gay scene ;
Touch'd by disease, or want, thou droop'st forlorn,
And all thy visionary prospects fade,
And fleet before thee like an empty shade.

15. *Sylvia's Address to the Rev. T. Baker.*

Long have our ears thy pious dictates heard,
Long have they claim'd our first, our best regard ;
Long has thy verse harmonious mark'd the way
To yon bright worlds where beams celestial day,
Where no alternate night of sin is known,
But joy unclouded reigns without a *Frown*.
There may our ardent wishes ever tend,
There may we meet our valued reverend friend,
And join th' angelic choir to Jesus' praise,
To sing his love throughout eternal days.

ANSWERS TO THE ENIGMAS.

Diary Enigmas.

- | | |
|---------------|------------------|
| 1 Bark, | 6 Nun |
| 2 Paper, | 7 Happiness, |
| 3 Cork, | 8 Lamp lighter, |
| 4 Pen or Ink, | 9 Sound, |
| 5 Night, | 10 or pr. Frown. |

Supplement Enigmas.

- | | |
|---------------|--------------|
| 1 Peace, | 5 Hatchment, |
| 2 Darkness, | 6 Carpet, |
| 3 Friendship, | 7 G, |
| 4 Birds-nest, | 8 Taylor. |
12. *The Seasons: by Mr. G. W. Lemon, of East Walton.*
Once more fair Flora paints the dewy lawn,
In rural *Happiness* the rustics sing ;
The lark now floats upon the breath of morn,
And welcomes the return of genial SPRING.

No. V. Enigmas answered. 5

Allur'd by SUMMER, Strephon seeks the grove,
 And on the *Bark* inscribes his Laura's name; 1
 Breathes on his flute the dulcet *Sound* of love, 9
 And whispers to the breeze his ardent flame.
 Now AUTUMN calls the harvestman to work,
 Now golden Ceres loads the jocund team;
 Again the vent'rous school-boy on his *Cork* 3
 Sports o'er the bosom of the glassy stream.
 At length stern WINTER darts his fullen *Frown*; Pr.
 The cloister'd *Nun* now wastes the mid-night oil; 6, 5
 The nimble *Lamp-lighter* illumines the town, 8
 And students o'er their *Ink* and *Paper* toil. 4, 2

13. *Farewel to Jamaica: by Mr. Ra. Dutton, now of Hull.*

Nine years have rolled on, and something more,
 Since I embark'd to leave my native shore: 1
 But now, inclin'd to quit Sol's scorching rays,
 Back I'll return, and there I'll end my days.
 But first of all 'tis prudent to provide
 Quills, *Ink* and *Paper*, maps and charts beside. 4, 2
 Aided by these, th' unbeaten path I'll roam,
 Nor fearing death for *Happiness* at home. 7
 The pilot now assuming his command,
 "Weigh anchor, boys; the wind is from the land."
 Starting from *Sleep*, like *Lamplighters* they fly, 5, 8
 Eow! Eow! they at the windlaid cry.
 Come, mix a glass of grog for ev'ry man,
 Uncork the flask, and hand to me the can. 3
 The farewel gun is follow'd by three cheers,
 And back the *Sound* re-echoes to our ears. 9
 'Tis 5 A. M. the index strikes the bell,
 Our sails are full; Jamaica, now farewel.

Enigma 6 is a *Nun*, and the Prize a *Frown*.

14. *Enigmas in the Diary and Supplement answered by Aminicus, in a Prospect of Evening in the Country.*

"Now fades the glimmering landscape on the sight,
 "And all the air a solemn stillness holds,"
 Save where the *Barking* dog directs his flight, 1
 Thro' the *Dark* shades of evening's silent folds, 2 S
 The lab'ring peasant, from ambition free,
 Unto his peaceful cot with joy repairs;
 Nor needs the aid of lighted *lamps* to see 8
 The well-trod path mark'd out by length of years.
 Now glows the *friendly* fire, while jocund mirth 3, 7 S
 With *Happiness* serene the evening crown; 7

His little *Nuns* * give joy a livelier birth, 6
And, smiling round, the toils of labour drown.

Religion's precepts in their gentle minds
He anxiously endeavours to instill :
With pray'rs each night their clay built *Nest* resigns 4 \$
To him who does their empty coffers fill.

And thus, devoid of *Frowns*, or ruder *noise*, 10, 9
The circling hours pass on without alloy :
His spouse, his *Taylor*, mends his rustic clothes, 8 \$
While he pen, *Ink* and *Paper*, oft employs. 4, 2

Ye lords and nobles, who on *Carpets* tread, 6 \$
Who (when Death draws the *Cork* of life away) 3
Rear up the proud *Escutcheons* over-head, 5 \$
As pompous tokens of departed clay.

Say, does such tranquil *Peace* your ev'nings crown? 1 \$
Do *midnight* balls afford you joys like these? 5
Ah no! such pleasures virtuous objects drown,
And only for a time, are ever known to please.

15. *An Invocation: by Eliza S—— of the Dale.*
No matter when; 'twas on a winter's *Night*, 5 D
My fancy long'd to take poetic flight;
Methought why thus sit mute, like some lone *Nun*, 6
While numbers crowding to Parnassus run?
What *Happiness*, could I but hope to gain 7
One sprig of laurel at Apollo's fane!
With haste I call'd for *Paper*, and for *Ink*, 2, 4
And then I set my wits to work to think :
Guide, gentle *Muse*, the *Bark* that would explore 1
The windings dark of enigmatic lore ;
“ Direct each vague idea of the brain,
Light as the *Cork* that floats upon the main.” 3
The wish she kindly heard, the veil withdrew,
Quickly through air like *Lamplighter* she flew, 9, 8
And cried, without an angry *Frown*, 'Tis done : Pr.
These lines explain the riddles every one.

16. *Address to Lady Di. on her increasing Correspondence:*
by Mr. Geo. Stevenson of Howdon.

Dear Lady, I'm *Happy* each year to behold 7
New friends still appear, who are by you enroll'd
In your *pages* of fame; which will last while the sun 2
Enlightens our system, that round him does run : 8
Who avoiding the ways both of folly and vice,
As drinking or gaming, with cards or with dice,
Embark in your service, and purchase content ; 1
In the paths of fair science their time then is spent ;

* Children.

No. V. Enigmas answered.

7

And each silent *Night*, while pale *Luna* does reign, 5
 The *Muse* they invoke in sweet varied *strain*. 4, 9
 May they not, like *fops* who but court to deceive 3
 The *innocent Fair*, and then leave them to grieve,
 After gaining your favour, your company shun,
 But constant continue as they have begun :
 Then success their labours will certainly crown,
 Nor need they regard tho' four critics should *Frown*. 10

17. *The Diary Enigmas answered by Mr. B. Cleypole.*

What *Happiness* waits on the man that's content 7
 With the lot that's assign'd him below ;
 On wild or extravagant notions ne'er bent,
 Nor allur'd by the vot'ries of show !
 The farmer like *Lamplighter* skips o'er his ground, 8
 Nor envies the pomp of the great ;
 Title or honour to him's a meer *Sound*, 9
 Nor troubles he matters of state.
 Like the *Bark* on a tree, he sticks close to his friend, 1
Frowns, anger, and passion subdue ; Pr.
 With a heart light as *Cork*, stated *Nights* will attend, 3, 5
 Rural pastimes and mirth to pursue.
 The fair who abandons high life's giddy round,
 In a *Nunnery's* retirement to live, 6
 With pen, *Ink* and *Paper* amusement is found, 4, 2
 And true satisfaction may give.
 On the stage of this world, those who act their part right,
 Will endeavour gross errors to shun ;
 And rational beings must own it is right,
 Self-content makes us smoothly glide on.

18. *The Wish : by Mr. J. Brown, Master of the Free-School at Lavington, Lincolnshire.*

In our isle may religion and liberty be
 As closely connected as *Bark* to a tree. 1
 May whatever *Paper* in writing we use, 2
 Instruction, good morals, and virtue transfuse.
 May health's rosy bloom on each village be found,
 And wine, when the *Cork's* drawn, go cheerfully round. 3
 May our *Ink*, red or black, when used a *Night*, 4, 5
 Well answer our ends, and set every thing right.
 From *Nuns*, monks and friars may ever be free, 6
 And *Happiness* attend us wherever we be. 7
 May every city each dark winter's night
 Employ a *Lamplighter*, the streets clear to light. 8
 May our friend *Lady Di* with success e'er be crown'd,
 And thro' ages to come may her fame much resound. 9

May wealth, peace, and plenty, our industry crown,
And Heaven ne'er cast on old England a *Frown*. *Pr.*

19. *The Diary Enigmas answered, by Dick the Lamplighter.*

No longer my weather-worn *Bark* could prevail, 1
Thro' misfortune no longer experience could steer;
Like *Paper* the adverse winds shiver'd my sail, 2
And distress and dishonour began to appear.
In youth like a *Cork* lightly danced I then; 3
Down the current of life how I glided away!
Love dwelt in my heart, and love prompted my *Pen*; 4
The theme of my rapture by *Night* and by day. 5
To smile on my verses indulgently seem'd
The prude and coquet, and the wanton and *Nun*; 6
'Twas *Happiness* all, as I foolishly deem'd, 7
So I frolick'd, I trusted, and, ah! was undone.
As a *Lamplighter* now, in disguise from all eyes, 8
From the *Sound* of all flattery happily free, 9
No longer the gewgaws of fortune I prize,
And her *Frowns* or her smiles are quite equal to me. *Pr.*

20. *The Disappointment: by Mr. William Gradidge of Canterbury.*

What *Sounds* are these salute my ears? 9
From whence arise these doubts and fears?
Methinks my *Delia's* love's grown cold,
Else why does she her notes withhold?
Sometime ago when fortune smil'd, 6
She all my youthful heart beguil'd:
But now a solemn *Frown* she wears. 10
No more of *Delia's* smiles or tears,
No more her sympathizing love
Will every care of life remove;
No more her *Pen* will *Paper* stain, 4, 2
Nor from her shall I hear again.
As light as *Cork* her love is grown, 3
And all my days of joy are flown.
A *Bar* is put 'twixt *Bliss* and me, 1, 7
No more her eyes a *Lamp* will be; 8
But dark as *Night* my days must move. 5
Henceforth I bid adieu to love;
And only on my charming *Di*
For future favour I rely.

21. *On Night: by Mr. John Fildes, Schoolmaster, Liverpool.*

Bright Sol beneath the western wave descends,
And *Frowning Night* her sable shade extends. 10, 5
The *Lampboy* whiffing thro' the murky gloom, 8
Illumes with rays the glass or *Paper* dome. 2

No. V. Enigmas answered. 9

Pale *Nuns* now muse within the cloister'd wall, 6
 And surly curs *Bark* round the country hall. 1
 The drunkard sits beside the tavern fires,
 Glass after glass the thirsty sot requires;
 The stubborn *Cork* oft from its prison draws, 3
 And with much *Noise* and nonsense seeks applause. 9
 Unhappy man! to glory in his shame, 7
 And stamp a lasting odium on his name. 4

22. *To the ingenious Diary Contributors: answering the Enigmas in both Diary and Supplement, by Vertigo.*

O ye, whose magic pencil charms the sight,
 And holds it deep-entranc'd with fix'd delight;
 Whose potent touch, like alchemists of old,
 Transmutes the basest metal into gold;
 Permit a youth, no matter what his name,
 Let it suffice, he is unknown to fame,
 Oblivion with her shapeless veil invades
 His temples with impenetrable shades,
 Once more in your assembly to appear:—
Bark not, ye critics, spare the lash severe. 1 D

Fain would I write! Oh! could I paint like you,
 What magic *Pictures* would I raise to view, 5 S
 From airy nothing wrought, whose power should charm
 The most unfeeling, and the frigid warm!
 But I want skill, I want the art to please;
 My verses boast nor elegance nor ease:
 Unlike your own, devoid of ev'ry grace,
 Dull they flow on, and each is out of place;
 How vast the difference, were the contrast made!
 Mine "flaunt in rags," yours "lutter in brocade."

I claim no *Friendship* with the Muses train, 3 S
 Frowning they eye me with a fix'd disdain. Pr.

Yet, tho' I cannot tune Apollo's lre,
 Such as Apollo might himself admire,
 Yet I, in spite of ev'ry muse, can rhyme;
 In spite of Phoebus shall my verses chime.

Ye lovely nymphs, who from *Piccia's* bow'rs
 Have cull'd the choicest, most delicious flow'rs,
 That by fam'd *Aganippe's* fountainspring,
 O! how shall I your pleasing labour sing,
 In strains which, like your own, flow smooth along,
 With all the varied elegance of song?
 In vain I try your matchless worth to raise;
 Your matchless worth transcends my utmost praise.

Ye *Virgins*, hail! may never envious *Night* 6, 5 D
 Steal on you, and deprive your lamps of light; 8 D

Long may you here in *Happiness* abide, 7 D
 With meek-eyed *Peace* sweet smiling by your side. 1 S
 Till fate, inexorable, her *shears* applies, 8 S
 And your frail body wrapp'd in *Darkness* lies. 2 S

But hold—enough—shudd'ring methinks I hear
 This just rebuke *Sound* on my trembling ear: 9 D
 “And what art thou who vainly thus essays,
 “With matchless impotence, a band to please,
 “Where shines a *Richardson*, a *Harpur* shines,
 “With lustre beaming from their polish'd lines?
 “Go—hunt for *Birds-nests*—or thy *Kite* prepare, 4 S, 2 D
 “And launch it on the bosom of the air;
 “Light as a *Cork* behold it upward rise, 3 D
 “And follow it with thy admiring eyes:—
 “In trifles such as these well suit thy pow'rs:
 “Vain youth, forbear!”—I feel the just command,
 And drop the worthless *Pencil* from my hand. 4 D

23. *Elegy in a Church-yard: by Mr. J. Davison, Newcastle.*

When *Darkness* had her sable curtain spread, 2
 And to his *Nest* each warbler of the spray 4
 In *Peace* had long retir'd; I to the dead, 1
 All slow and silent, bent my pensive way.
 The mournful torn *Escutcheon*, waving o'er 5
 Of *lux'ry's* fav'rite child the humbled dust, 6
 In solemn language seem'd to say, “No more
 “Avails *or* wealth *or* *Grandeur's* pompous bust: 7
 “Succeeded by the winding sheet abhorr'd,
 “The splendid robes the flutt'ring *Taylor* made!” 8
 I saw the devastation, and deplor'd,
 And wept till morn in death's cold dreary shade:
 Then sigh'd, “How precious is a life well spent!
 Let me live virtuous, and I'll die content.”
 The third Enigma is *Friendship*.

24. *David's Choice: by Mr. Philip Rusher.*

Famine, the sword, the pestilence! great God!
 From such a choice must David take the rod?
 No friendly hand can save: the doom is giv'n, 3
 And who may stand before the wrath of Heaven?
 Involving *Darkness* must around them spread, 2
 And graves shal open to receive the dead. 5
 Yet 'tis a proof of mercy thus to Give 7
 A choice of death, to those who must not live.
 Yet nature still revolts; and David's heart
 Is fill'd with terror and remorseful smart.
 He knew no kingdom could relief afford
 When God made death; and if he chose the sword,

His sword would want an arm, and man his skill,
 When *Peace* is fled, and heaven prepares to kill. 1
 In thee, great God! he plac'd his only trust,
 With soul resign'd and humbled to the dust;
 Secure in thee, he'll stand the mighty shock,
 Firm as an eagle's *Nest* upon the rock. 4
 He knew thy mercy took the greatest place,
 He knew thy former love, thy wonted grace;
 Of all his choice he yields to kiss thy rod,
 Not fly from man, but bow before his God.

Teach us, O God! to choose as David did,
 And trust thy mercy in the time of need;
 That when this earthly garment of thy trust,
 By nature's *workman* made, is laid in dust, 8
 Beneath the *Carpet* of its native earth, 6
 Our souls may fly to thee for second birth.

25. *Address to Spring: by G. D. of Brick Lane, Christ Church.*

When winter storms and cold are chas'd away,
 And Sol's bright beams inspire the cheerful lay;
 When *Darkness* dull resigns her gloomy reign, 2
 And *Peace* and plenty fill the wide domain, 1
 I welcome Spring—sweet time of mirth and love,
 A striking semblance of the realms above.
 The feather'd choir anticipate the joy,
 And *Nestling* birds seem eager for employ. 4
 Let me not then my time in folly lose,
 Or study *Tailors*, for fine suits of clothes: 8
 By day my dress be plain, my mind serene,
 At night repose in *linen* sweet and clean. 6
 While wisdom guides, I'll *Friendship*'s ways explore 3
 Nor dread the thought of *Hatchment* o'er my door. 5
 But, if I'm blest with many years to come,
 I'll quiet live, nor seek another home.
 Conscious of this, that Britain's sons must smile,
 While George's name adorns this happy isle. 7

*See the Acknowledgments in the Diary.—Mr. Thos. Anderson's
 ingenious solution came too late to hand.*

ANSWERS to the REBUSES and CHARADES.

<i>In the Diary.</i>		<i>In the Supplement.</i>	
<i>Rebuses.</i>	<i>Charades.</i>	<i>Rebuses.</i>	<i>Charades.</i>
1 Tea and	Woollack,	1 Wigan,	Mandrake,
Toast,	Manage,	2 Wax,	Dove-house,
2 Care,	Courtship,	3 Husband,	Snow-drop,
3 Glass,	Ribband,	4 Left-hand,	Sackbut.
4 Pen.			

10. *The whole answered by Juvenis Boxtoniensis.*

Give me, kind Heaven, thro' life some rural spot;
 Near lovely *Wigan* fix my happy lot.
 Seat of *Reflection*, but devoid of *Care*;
 Oh, that my earthly race may finish there!
 But first, with virtuous and endearing wife,
 Here let me tread the peaceful paths of life:
 No tawdry gewgaws catch my vacant heart,
 Or *Ribbands* fluttering with false female art;
 But drawn by virtue's lure alone, to bend
 To happy *Courtship*, with her happier end.
 Thus would I yield, full captiv'd to her charms,
 An happy *Husband* in *Louisa's* arms.
 Rightly to *Manage*, should employ our *Care*,
 Our time, our pleasure, and our rural fare.
 Whether the *Pen* in vacant time should ply,
 Or neighbouring ills arrest attention's eye,
 To cull the simples of th' adjacent grounds,
 Where *Mandrake*, and each healing herb abounds;
 Or to domestic calls some portion spare,
 The *Woolfack* or the *Honeycomb* our care;
 Visit the *Dove-house*, and the nurrling dove,
 (True emblem of our permanence of love)
 Oh! virtue bright, within a snow-white breast;
 Compar'd, outdone the *Snowdrop* stands confest.
 When summer calls, unlearn'd in arts of France,
 We'd tend the *Sackbut*, and the rustic dance.
 But when the wint'ry storms assail our isle,
 With one true friend or two we'd wish to smile,
 Defy the raging winds that tear the coast,
 Sip our warm tea, and doubly learn to *Toast*;
 Wear a soft night-cap, in one genial *Glass*,
 To lady Di; to every virtuous *Lass*.

11. *The Charades answered by Mr. P. Russer.*

In *Courtship* if you'd manage well,
 With *Ribbands*, *Snowdrops*, treat the belle,
 Try every art to please:
 Be sometimes serious, sometimes gay,
 And sometimes let the *Sackbut* play,
 To give the fancy ease.
 Bid her the *Dove-house* tenants mark,
 And tender *Mandrakes* in the park,
 How all are form'd for love;
 Shew how the pretty lambkins play,
 And spread their *Woolacks* to the day,
 As with delight they move.

Tell her the sorrows of your heart,
Be just, and act a generous part,
A lover and a friend :
With manly converse please her ears,
With manly conduct ease her fears,
And you must gain your end.

12. *Rebuses and Charades answered by Mr. Nath. Foot.*

For gentlemen and ladies fair,
A proper treat to find,
Long time I strove with anxious *Care*,
And thus I *Pen'd* my mind,
With *Tea* and *Toast* the wife regale,
The husband with a *Glass* ;
A *Lass* give to a bachelor,
And thistles to an *Ass*.
With *Ribbands* and with toys your love
In *Courtship* you may gain :
To manage well a wanton wife,
You still may strive in vain.

The same, by Mr. J. Hunt, of Stony Stratford.

In a party at *Tea*,
They all did agree
That my fair one's the *Toast* of each day ;
Her *Ribband's* so neat,
To *Court* her is sweet,
No *Pen* can her virtues display.
Then to *Manage* affairs,
And prevent further *Cares*,
I shall wed her by Midsummer eve ;
For the man is an *Ass*,
Who, for sake of his *Glass*,
Leaves his girl in vexation to grieve.
If to tend a few sheep,
Whilst together we keep,
Be employment she likes to pursue,
As we carelessly rove
Thro' meadow or grove,
I'll be ever contented and true.
At the foot of a hill,
By the side of a mill,
I would there fix our rural retreat :
No ambition or noise,
Should disquiet the joys,
That in silence and solitude meet.

Many other ingenious answers to the Rebuses and Charades, both in the Diary and Supplement, were given by the following ladies and gentlemen,

viz. Aramont, James Ayres, Job Ayres, Rob. Barwick, junr. P. Bastow, J. Bailey, George Biggs, T. Bulmer, W. P. Burman, John Burrow, John Campbell, Rd. Carlisle, John Cavill, B. Cleypole, R. Cockrel, I. K. Coles, J. Collett, Wm. Coultas. Country correspondents, Geo. Cowen, John Craggs, Jos. Dale, J. bn Dalton, James Davison, Rd. Dening, Rob. Dowden, John Elliott, Rev. J. Ewbank, Mrs. Sophia Farey, S. G, Tho. Giles, A. Glendenning, John Griffith, T. H, J. Hartley, Jos. Hatfield, Eliza Hodgson, Jonathan Hornby, J. Hudson, John Thomas Hughes, John Jackson, Wm. Jones, John Liddell, Lintoniensis, A. M, Nancy Mason, Jos. Nendick, rd. Nicholson, Norwichiensis, Anne Porter, Alex. Rowe, Rd. Rowe, John Ryley, Fra. Smith, George Stevenson, Wm. Stone, Wm. Swift, L. T, W. Tarmior, Terpsiphilus, Mat. Thorpe, M. Tweddle, J. Walton, Robert Wilkinson, and George Wright.

ANSWERS TO THE DIARY QUERIES.

Query 1. Answered by Mr. Wm. Gradidge, of Canterbury.

To a person of a truly generous and good disposition, in my opinion the conferring an obligation, or communicating pleasure, is as great a happiness as he is capable of feeling. To do good and communicate bliss is so congenial to our *best tempers*, and so imitative of the benevolence of the Deity, that the mind that possesses such a disposition, must be capable of thence deriving more pleasure, than from any favours or obligation that could be conferred upon him.

The same, by Mr. Geo. Stevenson, of Howdon.

The conferring an obligation, which to a generous mind is the greatest pleasure, and amply repays the owner in proportion as he makes others happy. He thereby in some measure resembles the Deity, who giveth to all liberally, and upbraideth not: and St. Paul says it is more blessed to give than to receive. On the contrary, though the generous man is the only person that is truly sensible of an obligation, he will be uneasy that he cannot repay it, and his modesty hurt in receiving.—To take more pleasure in receiving than in giving shews a sordid disposition, that looks only to a person's own interest; and indeed from a selfish disposition spring most of the evils we observe in society, which endeavours to appropriate all advantages to itself, at the expence, and even to the prejudice, of its neighbours.

And nearly of the same opinion were most of the other contributors, who solved this query; a list of which is given at the end of the solutions of all the queries.

Query 2. Answered by Mr. Tho. Leybourn, of North Shields.

I believe it is impossible for any person who has felt the passion of love to such a degree as specified in the query, ever to

feel the like passion for any other object after being deprived of the first.—And I am told by a lady of my acquaintance, who has been married several years, that she felt the passion of love in its fullest force for a young gentleman, who had the misfortune of being shot in a duel, which caused her to lose all relish for company for some time. Yet she married another gentleman some years after, with whom she lives at present very happy. But she positively assures me that she can never feel such an affection for him as she did for the first.

The same, by Mr. Geo. Stevenson.

I think it is not possible to feel an equal passion afterwards. There will always remain a melancholy remembrance; and though time may allay the pain, it can never totally cure the wound sustained by the first loss: so that there can be only a *divided* affection for any other object.

The same, by Calophilus, of Sheffield.

The fair proposer has put this query in such strong terms as evidently discover her own opinion: which seems to be justified by reason and common experience. For, where an affectionate attachment has been deeply established upon virtuous principles, it forms a kind of habit; and has so forcible an effect upon the mind, as will scarcely admit of its being equally transferred to any other than the first object. And though a second connection may be formed upon esteem; and though it is highly probable that there have been many *comfortable* second marriages; yet it is much to be doubted whether they were ever attended with that ardour of affection which accompanied a first love.

And of the same opinion are most of our contributors; though a very few express themselves as of the contrary opinion.

Query 3. *Answered by Mr. Ralph Dutton, of Hull.*

Sugar is the essential salt of sugar-cane, as tartar is of grape; and water is the proper menstruum or dissolvent of all salts, and of many other articles; the same as marine acid is of zinc, iron, or copper; or as spirit of nitre is of all metallic substances whatsoever, except gold. These properties they seem to inherit from the law of nature, having been proved by long experience. But why these solvents are thus peculiarly adapted to their solvends, appears never to have been discovered. Dr. Shaw, in his Chemical Lectures, says that the action of menstrooms depends upon a certain secret and reciprocal relation betwixt the solvent and solvend, scarce cognizable by the direct senses, nor hitherto well made out by instances and inductions.

Query 4. *Answered by Mr. John Burrow, of Boltonfield.*

The wetting of the body below the warm bread, is owing to the vapour, which on the upper side rises and disperses in the air; but being obstructed on the under side by the table, the electric particles pass through the table, leaving only the aqueous particles behind.

The same, by Mr. Henry Mellanby, of Stockton.

The coldness of the table condenses the moisture of the bread, and so causes the wetness. For a proof of this, warm the table, or a trencher, and you will see no such effect.—Any bodies which of themselves are very cold, have the power to condense the moisture of the air in damp weather. Marble tombs, for instance, in such weather become quite wet.

The SUPPLEMENT QUERIES ANSWERED.

Query 1. *Answered by Mr. John Liddell, of Habton.*

The light reflected from the bottom of the drop, which is a little flattened by lying on the oily or repulsive surface of the leaf, gives this splendid appearance. There being a thin plate of air between the leaf and the drop, which forms the reflecting surface, and by the convex upper surface of the drop a magnifying lens is formed, which greatly augments the lustre.

The same, by Mr. T. Cock, Teacher of Mathematics and Natural Philosophy.

The rays of light which enter a globule of water are first refracted by its upper surface, then reflected by its lower internal surface, and lastly refracted again by its upper surface; and as the lower surface is, by the weight of the globule, flattened and formed into the segment of a large sphere, these rays will have their focus at a considerable distance from the globule; and if an eye be placed in or near the focus, it will receive the dense emerging rays, by which the globule will appear like a speculum strongly illuminated.

Mr. Henry Mellanby, of Stockton, says,

The globules of rain do not lie upon the surfaces of the leaves of colewort, &c. but are supported a little above them at the ends of small hairs: and the effect of refraction and reflection in spherical drops of water is well known.

Query 2. *Answered by Mr. W. Bearcroft.*

A bell, when struck, is immediately thrown into an oval form; but being of an elastic nature, it returns to its circular figure, and by a vibratory motion to an oval form again the other way. These vibrations repeated, give and continue the

found. Now it is evident that a crack must spoil the tone of the bell, by destroying the continuity of its parts, and by the grating or jarring of the edges of the crack one against another in its vibrations, which will be still continued, though in a feeble manner : and it is equally evident that a hole can neither affect the vibrations, nor produce the grating or jarring that a crack does. As to the most effectual method of recovering the sound of a cracked bell, it must certainly be re-cast ; unless any person will undertake to solder it effectually with the same metal, which is perhaps impracticable.

Mr. Jos. Hatfield, of Laytham,

After accounting for the loss of sound, as above, to recover it again, recommends this method : File out the roughness of the crack ; stretch the bell in the manner of wedging, and put in one pure piece of copper as a rack ; then plate it uniformly with two strong bars of copper or iron, and good rivets, not to let the rivets touch the bell.

Mr. John Jackson, of Hutton-Rudby school, says,

The edges of a hole in a bell, not touching one another, can no more affect the vibrations, and consequently the sound, than can the edges of its mouth : but in a crack, the edges rub one against another when it vibrates, and either destroy the sound, or cause a jarring one. Hence, a small metal wedge, put into the crack to hinder the edges from touching, will in some measure recover the sound : but I should think, if the crack was run up with solid metal, it would more effectually recover it ; though I believe that casting it over again is the best cure.

Mr. Henry Mellanby, the proposer,

After observing upon the effects of a crack and a hole as above, says, the most effectual and easy method to recover the sound of a cracked bell, is to cut the chink or slit clean out, so that the edges may not touch each other. The bell will then have a deep sound, but will not continue so long.

Query 3. Answered by Mr. John Jackson.

There is a kind of a light, subtle effluvia arises from the mixture of colour, oil, and spirits of turpentine, much of the same nature as the electric matter ; and as water is a well-known conductor, it will also in course, while in the sphere of attraction, most powerfully attract it, and not only take off the nauseous smell of the paint by drawing the effluvia, but also the light unctuous particles will be attracted along with it, so as to take off the gloss from the paint : as may be observed

by setting the bucket to the door after it has stood in the new painted room all night; for the light striking upon the oily particles swimming in little globules upon the surface of the water, will exhibit a variety of colours, caused by the different reflections and refractions of the light falling upon these unctuous particles upon the surface of the water.

Query 4. *Answered by Mr. John Fildes, schoolmaster at Liverpool.*

When a fire is kindled, the air near it soon becomes much rarefied, and the surrounding air rushing in to restore the equilibrium, produces a current, which assists the hot smoke in ascending up the chimney; at the top of which, if the atmosphere be heavier than the smoke, the latter will still ascend, till, gradually cooling and condensing, it arrive at a height where the atmosphere is equally heavy with itself, where it will float; but if the atmosphere be lighter, as is sometimes the case, the smoke must needs descend.

Mr. Tho. Leybourn, of North Shields, says,

I have often observed smoke rising up a chimney, and then falling to the ground again; though this was never the case but when the atmosphere was very dull and thick, shewing for rain. I may venture to say I have observed the same hundreds of times, and when the smoke happened to fall to the ground, a shower was sure to follow soon after. Nay, so common was it, that when any of my school-fellows have seen it, they would say, "Leybourn, we shall have rain, the smoak falls to the ground."

For want of room, many other ingenious answers to the queries are obliged to be omitted, that were given by Messrs Aramont, James Ayres, Job Ayres, Bartonienfis, Rob. Barwick, junr. W. Bearcroft, W. P. Burman, Calophilus, John Burrows, Ra. Burton, John Campbell, Candidus, John Chapman, T. Cock, Rd. Cockril, Wm. Caultas, George Cowen, Jos. Cowing, John Craggs, John Dalton, Ra. Dutton, John Fildes, A. Glendenning, Wm. Gradidge, John Griffith, Jos. Hatfield, Elizabeth Hodgson, Jonas Hornby, John Hunt, John Jackson, M. Laidman, Anthony Lawson, Tho. Leybourn, John Liddell, A. M., Henry Mellanby, Alexander Rowe, Rd. Rowe, Sam. Skerritt, George Stevenson, and Robert Wilkinson.

NEW ENIGMAS.

I. *Enigma, by Mr. J. K. Coles, near Wells.*

Ladies, attend, who would my name disclose.
Without me, beauty disproportion shews;
I cause that slender shape, and gentle air,
Which are distinguished in the British fair.

My form is thin, and delicate to view,
 Just calculated to attend on you :
 When at the park, the masquerade, or ball,
 The theatre, or gardens of Vauxhall,
 I constant with your ladyships have been,
 Nor would you wish without me to be seen.
 What would young Strephon give thus to be blest ;
 In my embrace you daily are carefs'd :
 When to your secret chamber you repair,
 I also gain a free admittance there :
 Whole nights in your apartment I abide,
 For I'm a friend in whom you can confide.
 Your secrets true and faithfully I keep,
 And watch you while o'erwhelm'd in balmy sleep.
 And when bright Sol returns with radiant light,
 And drives away the gloomy shades of night,
 Then strait you take me to your lovely arms,
 And in my fond embrace resign your charms.
 Of such import am I among the fair,
 That if they ride to take the morning air,
 I'm always present, and without me they
 Perhaps will not appear out all the day.
 Then, lovely nymphs, since thus by you esteem'd,
 Explore your servant's name, for so I'm deem'd ;
 The hidden mystery present to view,
 And you'll oblige your humble friend : adieu.

II. ENIGMA, by *Mr. Wm. Jones, of Heyford.*

Pure as Aganippe's spring,
 Near whose stream the Muses sing,
 See my source ; but, ah ! ye fair,
 All the ills I'm doom'd to bear,
 Ere I quit the brazen hold,
 Busy thought will soon unfold ;
 Busy thought the scene pursue,
 Set the process full in view :
 Bring with haste the bearded grain,
 Strew it o'er the level plain ;
 Make the whiten'd billows roar,
 Till they lash the polish'd shore :
 But let caution ever guide,
 To restrain the madd'ning tide ;
 Lest it o'er the margin flow,
 And soon deluge all below ;
 Thus you'll every danger shun,
 And well end what's well begun.
 Come now, ev'ry gentle bard,
 Let my merits claim regard.

Ye, who oft my favours share,
 Ponder well what I declare ;
 Shun the tables of the great,
 Duly prize my homely treat :
 For with truth I can advance,
 I'm the friend of temperance :
 And 'tis known that health and she
 Always are in amity.
 Guttile, fam'd for mighty feats,
 Who delights in city treats ;
 When the fumes of wine are gone,
 And reflection presses on,
 Lest the rose-hued nymph should go,
 Hastes to me to save his toe.

Should a restless form be found,
 E'er to leap the iv'ry mound,
 And pretend to regulate
 What's obnoxious to the state,
 Wild disorder takes the rein ;
 Uproar, with her noisy train,
 Fills the dark internal space ;
 Cloudy sorrows mark the face :
 Hollow murmurs, heard afar,
 Speak the dire intestine jar :
 While such foul commotions rage,
 I to rout the foe engage ;
 Soon I gain the mystic clue,
 And with haste his steps pursue ;
 Disregarding windy taunts,
 I pervade his secret haunts :
 And tho' *knights* before him flee,
 He in turn must yield to me.

III. ENIGMA, by *Adalina*.

Without any preface, or tedious oration,
 I'll begin of my hist'ry the simple narration.
 I'm a soldier, a gen'ral of mighty renown ;
 I can't say I'm a king, tho' I oft wear a crown.
 Tho' but small is the army o'er which I command,
 'Tis a very select and a well-chosen band.
 My soldiers are cloth'd as by whom I am led,
 Some gravely in black, others gayly in red :
 I always (and one of my captains) wear black,
 For I scorn to plod on in old custom's dull track.
 We have read of a king who was row'd on the Dee
 By eight other kings, who to him bow'd the knee :
 That I'm equal to him I with truth cannot say,
 Yet I've kings in my train, who to me homage pay :

One or other of these, as my steps they attend,
 I distinguish with favours, and call him my friend.
 I'm to vanity giv'n, fond of pomp and of show,
 And I oft wear my crown when to battle I go.
 There you'll see me, 'midst ensigns and trophies display'd,
 With garter, and motto, and gewgaws array'd.
 From various climes my men probably came,
 For they differ in feature, complexion and name.
 We are seldom at peace, for to fight is our trade :
 On a smooth verdant plain, which on purpose is made,
 See our army assembled, for battle prepar'd,
 The troops rang'd in order, the phalanx all squar'd.
 Unlike other battles, spectators with glee
 Stand by to look on, and are well-pleas'd to see
 Our manœuvres and tricks, how we labour and toil ;
 And while they are amus'd, we aim at the spoil.
 In our battle no blood's shed, not such are our wishes ;
 Like statesmen we fight for the loaves and the fishes.
 In the skirmish, tho' pow'rful and great is my sway,
 I am oftentimes forc'd to ——— no more will I say :
 For the ladies ere this, sure, have found out my name,
 And I'll trust to their honour to blazen my fame.

IV. ENIGMA, by *Lintoniensis*.

In portly state, and as with conscious worth,
 Ye fair Diarians, see me issue forth,
 " To push you from your stools." And not in vain
 My power, surrounded by my glittering train
 Of bright companions ; all to aid the plan,
 And drive you from that vilest creature, man ;
 Whilst others of our band, beyond his view,
 Do share your kisses and your smiles—and you,
 In conclave secret, unrestrain'd and free,
 Enjoy the jest and laugh as well as he.
 Nor ye deny but that ye know me there,
 Presenting you the mellow capillaire,
 Thirst-driving lemonade, or wine more gay,
 Your hearts to cheer, and drive your cares away.
 So—I'm no ghost ? No—seen by day or night,
 Quite different feelings always I excite,
 From fear or dread ; peculiarly belong
 To me the cheerful laugh and lively song.

V. ENIGMA, by *Miss Louisa Amelia Harpur, Bristol*.

My great ancestor, by supreme command,
 O'er hills and vales did guard a chosen band ;
 Grandeur and pride my lofty looks adorn,
 And various trappings, deck my stately form.

Some grace my head, whilst some my arms display,
 And my own hands adjust my drapery.
 Do costly gems your fancies e'er elate?
 Fine pendant-garnets too complete my state.
 My way's eccentric, and my progress wide;
 O'er my good conduct science does preside:
 Yet by fell discord sometimes I'm undone—
 Israel's sweet bard my wayward course has sung.
 Vast store my ample bosom does contain,
 Of worth beyond the muse's power t' explain:
 Tho' furious spirits often in me reign,
 And fill my breast with horror, guilt, and pain.
 Not, phoenix like, without compeer am I,
 Devoid of kindred, friend, or fit ally;
 A numerous race of relatives I claim,
 Differing in rank, in beauty, worth and fame;
 Heroes and sages, belles and polish'd beaux
 My genealogy will soon disclose.
 Th' historic page, the Grecian poet's lays,
 To time's remotest bounds transmit our praise.

VI. ENIGMA *by Matilda.*

I'm a lawyer, an actor, and reverend divine,
 In ev'ry employment and station I shine;
 I'm the busiest, best bred, compassionate creature,
 That owes its existence to good mother nature;
 I've a colleague, deceitful, vain, crafty and proud,
 Who acts as a promptor, unseen by the crowd:
 Sometimes he assigns me a part to display,
 Where mischief and falsehood dark ambushes lay.
 Not always however in this wicked mood;
 By turns he's humane, undissembling and good.
 A combatant doughty, I enter the field,
 And darts keenly pointed I frequently wield.
 In every nation and age since the flood,
 My skirmishes often have ended in blood.
 I am violent, yet gentle, I'm silly yet wise,
 And I aid, lovely ladies, your conquering eyes.
 I am found in most countries, with every lingo,
 From the regions of Zembla to fainted Domingo;
 Nay, in newly discover'd far distant Pelew,
 I am mov'd by fine feelings, if story says true;
 And that truth form'd the story, our credence must gain,
 Or Lee Boo was an evidence given in vain.
 I'm the chief of the junto when treason is brewing,
 Yet my powers perverted expose them to ruin.
 For confinement too subtle, no fetters can bind me.
 But enough—your discernment will presently find me.

VII. ENIGMA, *by Mr. Isaac Gumley, of Ansty, near Leicester.*

I boast not, like others, the splendours of birth,
 For like father Adam I rose from the earth ;
 Like him and his sons I'm surrounded with woes ;
 My friends are but few, and full many my foes :
 But soon, tho' at first my appearance is small,
 I rise in my stature o'erlooking them all.
 Immovably firm and undaunted I stand,
 And truly am great as each lord in the land.
 In summer, with gaudy habiliments tir'd,
 I please every eye, and am greatly admir'd :
 Around me the juvenile rustics resort,
 For needful refreshment, or innocent sport.
 There love-smitten Corydon vented his pain
 To young Arabella, the pride of the plain ;
 Whilst she with a look undisguised by art,
 Discover'd the passion that melted her heart.
 Sweet flowers all around me their beauties display,
 And music melodious enlivens the day ;
 While Hodge sings aloud, as his lambskins he leads
 To the streamlet that murmurs adown the gay meads.
 But earthly enjoyments will presently fail,
 And weighty afflictions sink down in the scale:
 For tho' I should long all these favours enjoy,
 My fortune must change, for I'm fated to die.
 Stern winter will come ; then my foes, fierce and bold,
 Will strip me, and leave me expos'd to the cold ;
 And others with terrible weapons of steel,
 The tortures of death will oblige me to feel :
 To them I must yield, tho' so bulky and tall,
 And many, alas ! will rejoice at my fall.
 Ah ! well may I shrink at the rage of my foes ;
 They'll cut off my limbs, and my hide I must lose :
 My arms, that for others' protection were spread,
 To the flames will be doom'd, with my feet and my head :
 My body, alas ! will be trod on with scorn,
 And then without pity to pieces be torn.
 Now say what I am, let my name be reveal'd,
 For it's not my desire to be longer conceal'd.

VIII. or PRIZE ENIGMA, *by Vertigo.*

[Whoever answers it before Candlemas-day has a chance by
 . lot for ten Supplements.]

Sunt delicta tamen, quibus ignovisse velimus. *Horace.*

Ladies to you, whose pleasing manners grace
 A mind unsullied, and a faultless face,

I am devoted ; may I ever prove
 A kind instructor in th' affairs of love ;
 A love unfeign'd to choose from love but feign'd,
 To gain a conquest, or preserve it gain'd.

By me unfriended, if Miranda's hair
 In wanton ringlets sport to please the fair,
 These wanton ringlets sport to please in vain ;
 No smiling Cupids lurk to wound unseen :
 For like a monument that bending stands,
 For ever bending with fast-folded hands,
 Would be her pow'rs to keep in am'rous folds
 Sweetly entangled, all whom she beholds,
 If unpropitious I forget to shine,
 Nor warm'd her bosom with my rays divine.
 Yet think not I the sculptor's hand disdain ;
 No, from the sculptor's hand I honours gain ;
 And the same monument to Shakespear's name
 Is rais'd to me a monument of fame.

As from collision flints emit their fire,
 And from attrition flames th' electric wire ;
 So life to me excitement often brings,
 Save that my life from self-excitement springs.

All human kind possess a friend in me,
 But few I favour in a high degree :
 These favour'd few to madmen are allied,
 " And thin partitions" these from those divide ;
 Between them rais'd, " O what a nice barrier,
 " For ever sep'rate, yet for ever near !"

Indulgent Heav'n bestow'd me sure on man,
 To sweeten life, or cheer its little span,
 To ease the mind with too much care o'erworn,
 Or from affliction to extract the thorn.

Whene'er the banquet I conspicuous grace,
 More brightly shines each eye, more fair each face ;
 Touch'd by my wand, spleen glooms aloof, or dies,
 And pleasing mirth around the table flies ;
 The fireside sweeter gleams, or brighter glows,
 And pleasure, not its own, the bowl bestows :
 Yet I thus sportive am not always found,
 Nor flavour give to wine as it goes round,
 Nor cause the cheek with jocund mirth to swell,
 Nor rub the vein where laughter loves to dwell ;
 For if abus'd, I swift to mischief tend,
 And lance perhaps the bosom of a friend ;
 Before my presence fades, where'er I go,
 The cheek of laughter to the cheek of woe ;

While all around malignant slanders fly,
 And reputations sicken, droop, and die.
 Prepar'd to wound, lo ! artful Pindar stands,
 A deadly weapon beaming in his hands ;
 Strait from each skilful thrust I vig'rous spring,
 And onward fly, upborne on eagle wing.

New REBUSES, CHARADES, and QUERIES.

I. REBUS, by *Mr. John Savage, of Coventry.*

What does embrace each spreading tree,
 What tempted mother Eve to stray,
 What oft we our relations call,
 A baleful demon known to all,
 An emblem of eternity :
 Join th' initials, and you'll see
 A bard whose works divinely shine
 Through every stanza, every line.

II. REBUS, by *Vertigo.*

A valiant chief, who for his country bled,
 By stern Achilles number'd with the dead ;
 A Trojan prince, who by the artful wiles
 Of angry Juno bore unnumber'd toils ;
 A city once where learning brightly shone,
 By luxury and pride at length o'erthrown ;
 And he who for his bold presumption died,
 Rashly he strove the car of day to guide :
 Th' initials, when united, will define
 What charms the soul with rapture divine ;
 Sweet instrument ! — touch'd by a master's hand,
 Who can thy pow'rful influence withstand ?

III. REBUS, by *Mr. J. Walton, of Allan Town.*

Fam'd Heber's wife, who Jabin's captain slew,
 And he whose blood did change the violet's hue,
 That surly knave, the ferryman of hell,
 With Izhar's son, who in rebellion fell ;
 The god of sleep, old Nox's drowsy son,
 A nymph Idean, who prophetic sung
 The fate of Paris, and the Trojan state,
 And he whose life was lengthened thrice by fate :
 Th' initials join'd, will name a genius bright,
 Whom virtue guides, and wisdom's ways delight.

IV. REBUS, by *Mr. John Bayley, of Middleton.*

The bird that first salutes the early dawn,
 He who did once usurp Great Britain's throne,

She who with sable curtains closes day,
 A youth who did a huge Philistine slay,
 The main on which the tars with pleasure pass,
 A god that ruleth o'er the liquid mass:
 Th' initials join'd, a city will be found,
 For arts and commerce o'er the world renowned.

I. CHARADE, by *Mr. John Fildes, schoolmaster, Liverpool.*

Oft to my first the lovely British fair,
 Array'd in all the pomp of dress, repair.
 When hostile foes this happy isle invade,
 My next assists to guard your wealth and trade.
 Oh! may kind heaven my ardent wish approve,
 And make my whole succeed with her I love.

II. CHARADE, by *the Rev. Mr. J. Ewbank, of Thornton Steward.*

Collision my first into being doth bring.
 My next in the rigour of winter doth spring.
 Not far from St. James's my whole you may see;
 And Britain without me in danger might be.

III. CHARADE, by *Strephon, of Harperlee in Arcadia.*

See in my first the richest gem of life,
 If rais'd by joy, or sunk by baneful strife.
 And in my next rich commerce safely ride,
 O'er dangers deep and nature's awfulest wide.
 But may my whole, ye fair, your hearts employ,
 To raise the wretched and yourselves to joy.

IV. CHARADE, by *Pedro.*

Sister Ruth! Sister Ruth! prythee be not my first,
 While my second so charmingly blooms in your face;
 In the season of love is my third rear'd and nurs'd,
 And like love may obtain in your bosom a place.

PARADOX, by *Mr. Henry Mellanby, of Stockton.*

As Damon and Chloe one day were a-walking.
 And about love affairs, to be sure, they were talking;
 Says Chloe, "You're witty, and curious, I know,
 " For often before me you've shewn yourself so;
 " But, what is 't you have not, (yes, what must it be)
 " Nor ne'er had, nor can have, yet may give to me?"

I. QUERY, by *Philander.*

What is the reason why a light body floating in a teacup, or basin, or the like, when approaching the side, moves towards it with a rapid accelerated motion.

II. QUERY, by Mr. John Dalton, of Kendal.

After having been exposed for some time to a very cold wind, a person feels himself much benumbed : but soon after, on coming under shelter, the cold is suddenly changed into as great an extreme of heat. How is this to be accounted for ?

III. QUERY, by Aminicus.

It has been frequently observed, in making experiments with a thermometer affixed to a metal scale, that the mercury rises slower (though to the same height) than when on an ivory scale. Now as metals are known to be the best conductors of heat, what may be the reason of the above phenomenon ?

IV. QUERY, by Mr. S. Woolcott, of South Moulton.

Has there been a method yet discovered of constructing an air-pump with two barrels, such that the circular motion of the hand, in working it may be continued one way ? If it has been discovered be pleased to point out who has discovered it, and when ; and if it has not, be also pleased to give a description how it may be effected, as it is much to be desired, for the perfection of that curious machine.

N. B. Ten of the best answers to the Enigmas, Rebuses, &c. proposed in this Supplement, will be intitled by a lot to a prize of 10 of the next year's Supplements. Any compositions for the use of the Supplement, may be either sent in the Diary letters, as usual, or more directly and safely thus, to "Dr Hutton, Woolwich"; which must be franked or post paid, or they will not be received ; and sent before the end of April.

It is also hoped the readers of this work will excuse the price this year being set at 8 pence, as it cannot be sold for less, without loss to the author ; containing the same in quantity with the Diary, which sells for 10 pence.

ANSWERS to the MATHEMATICAL QUESTIONS, proposed in the last SUPPLEMENT.

I. QUESTION 13. Answered by Mr. Olinthus Gregory, Taxley, Hunts.

The content in gallons being 454, and 282 inches in one gallon, therefore $454 \times 282 = 128028$ is the content in cubic inches ; and since the depth is 1 inch, therefore the same number 128028 is also the area of each back in square inches. Lastly, as the area of a triangle is equal to half the base multiplied by the perpendicular, or the double area equal to the base multiplied by the perpendicular, therefore the perpendicular is equal to the double area divided by the base, that is, 256056 (double the area) divided by 555 (the base) gives $461 \frac{87}{111}$ inches, the perpendicular required.

The same, by Mr. Wm. Walton, jun. Newcastle.

Put $a=128028$ the area of the back in inches, $b=555$ the base of the triangular back. Then $\frac{2a}{b} = 461\frac{67}{183}$ inches, is the perpendicular of the triangular back sought.

Solutions to this question were also given by Messrs. James Adams, Wm. Ashton, Job Ayres, Rob. Barwick, jun. W. Bearcroft, Sam. Beasfall, T. Bournley, J. Brown, A. Buchanan, T. Bulmer, Wm. Burdon, Ra. Burton, Peter Charlton, Wm. Cook, Chas. Cox, John Craggs, John Cunningham, James Dale, Jos. Dale, John Dalton, Master Davis, John Dean, Rob. Dowden, Fidelio, Jos. Garnett, A. Glendennning, Geo. Greaves, John Griffith, T. H. J. Hartley, J. Haycock, Rd. Hoages, J. Holt, Jona. Hornby, Wm. Larus, John Liddell, Nancy Mason, Tho. Milner, Mich. Mooney, R. Mountjoy, Chas. Nichols, Rd. Nicholson, Norwichiensis, John Parker, Geo. Roberts, Ra. Simpson, Tho. Skearratt, Wm. Swarn, M. Thorpe, Jonas Welch, J. Whitcombe, T. Whiting, Rob. Wilkinson, Wottonensis, S. Woolcott, John Youart.

II. QUESTION 14. *Answered by Mr. Rob. Barwick, jun. Ringstead, Norfolk.*

For the number of crowns Lucy had at first put x . Then by Maria giving her 1, she will have $x + 1$; and as this makes Maria's equal, Maria will also have $x + 1$, and consequently Maria had at first $x + 2$. Now if Lucy had given her 1, she would then have had $x + 3$, and Lucy would have had remaining only $x - 1$; and now by the question Maria's are double of Lucy's, that is $2x - 2 = x + 3$; then by transposition,

$$\begin{aligned} x &= 3 + 2 = 5 \text{ Lucy's number,} \\ \text{and } x + 2 &= 7 \text{ Maria's number.} \end{aligned}$$

The same, by Master Jonas Welch, Pupil at Mr. Woolston's School, Adderbury.

Put x = number of crowns Lucy had,
and y = number of crowns Maria had.
Then, by the quest. $x + 1 = y - 1$,
and $2x - 2 = y + 1$.
Subtr. the upper, then $x - 3 = 2$.
Whence $x = 5$ = Lucy's crowns,
and $y = 7$ = Maria's.

The same, by Mr. T. Bournley, South Shields.

By Double Position, suppose Lucy had 4 crowns; then by the first condition Maria must have had 6; and by the second condition giving one of Lucy's to Maria, makes the former 3, and the latter 7, which is one more than the double of 3, that is, the error is 1 in excess.

Next

Next suppose Lucy had 6; then Maria must have had 8; and by taking one from the former to the latter, they become 5 and 9, the last of which is 1 less than double the former, that is the error is 1 in defect.

$$\text{Hence } 4 \times 1 = 4,$$

$$\text{And } 6 \times 1 = 6.$$

$$1 + 1 = 2 \quad 10(5 = \text{Lucy's crowns,} \\ \text{and consequently } 7 = \text{Maria's.}$$

According to one or other of these methods was the solution given by Messrs James Adams, Wm. Ashton, Job Ayres, Wm. Bearcroft, Sam. Beafall, A. Buchanan, Tho. Bulmer, Wm. Burdon, W. P. Burman, R. Burton, John Chapman, Peter Charlton, R. Cockril, Wm. Cook, Cbr. Cox, John Craggs, John Cunningham, James Dale, John Dalton, Master Davis, John Dean, Rd. Dening, Rob. Dowden, Jos. Garnett, A. Glendenning, Geo. Greaves, Ol. Gregory, John Griffith, T. H. J. Hartley, John Haycock, Rd. Hodges, J. Holt, Jona. Hornby, Wm. Laws, Tho. Leybourn, John Liddell, Miss Nancy Mason, Tho. Milner, Mich. Mooney, R. Mountjoy, Cha. Nichols, Rd. Nicholson, Norwichiensis, John Parker, Geo. Roberts, Ra. Simpson, Tho. Skearratt, M. Thorpe, Wm. Virgo, Wm. Walton, J. Whitcombe, T. Whiting, Rob. Wilkinson, Wittonensis, S. Woolcott, and John Youart.

III. QUESTION 15. Answered by Mr. Wm. Burdon, of Acafter Malbis.

Radius being 1, then
the tang. of 30° is $\frac{1}{3}\sqrt{3} = .57735$
and tang. of $22^\circ\frac{1}{2}$ is $\sqrt{2}-1 = .41421$
their sum is - - - .99156,
which is therefore less than 1, the radius, or the side of the square which circumscribes the quadrant. And therefore the assertion of Mr. Hobbes is not true.

The same, by Mr. Wm. Cook, of Hawdon.

$$\text{The natural tangent of } 30^\circ \text{ is } .5773503,$$

$$\text{and that of } 22^\circ\frac{1}{2} \text{ is } .4142136,$$

$$\text{the sum of which is } - .9915639.$$

Therefore the assertion of Mr. Hobbes is false; because the sum should have been 1, or the tabular radius, if it had been true.

The same, by Mr. John Haycock, of Ware, Herts.

By trigonometry, the tang. of $22^\circ\frac{1}{2}$ is $\sqrt{\frac{2-\sqrt{2}}{2+\sqrt{2}}} = \sqrt{2}-1$,
and the tangent of 30° is $\sqrt{\frac{1}{3}}$, the radius being 1; therefore,
supposing Mr. Hobbes right $\sqrt{\frac{1}{3}} + \sqrt{2}-1 = 1$, or $\sqrt{\frac{1}{3}} + \sqrt{2} = 2$; and, by squaring, $2\frac{1}{3} + 2\sqrt{\frac{2}{3}} = 4$, or $\sqrt{\frac{2}{3}} =$

$$\frac{D^2 - d\sqrt{Dd}}{D - d} \times .2618Db = 21643.09 \text{ the greater hoof ABC,}$$

$$\frac{D\sqrt{Dd} - d^2}{D - d} \times .2618db = 16140.55 \text{ the less hoof ADC;}$$

the difference is 5502.54 cubic inches,
which divided by 231 gives 23.82 wine gallons; and this, at
 $1s. 2d.$ per gallon, comes to $\pounds 1. 7s. 9\frac{1}{2}d.$ the difference of the
values sought.

The same, by Mr. Robert Wilkinson, North Shields.

Put $D = 38 = AB$, $d = 31\frac{1}{4} = CD$, and $b = 40$ perpen-
dicular height. Then $\frac{D^2 + d^2 + Dd}{2} \times .2618b = 37783.63$
inches $= 163.56$ gal. the whole content $ABCD$;

$$\text{and, Hutton's Menf. } \frac{D^2 - d\sqrt{Dd}}{D - d} \times .2618Db = 21643.26$$

inches $= 93.69$ gal. the greater hoof ABC ;
the difference of these two is $6987 = ADC$;
and the difference of these last two is 23.82 gal.
the difference of their shares, which at $14d.$ a gallon is worth
 $\pounds 1. 7s. 9\frac{1}{2}d.$

The same, by Mr. Rob. Dowden, of Woolavington.

The notation being made the same as before, then

$$\frac{D^2 - d\sqrt{Dd}}{D - d} \times .2618Db = \frac{D^3 - Dd\sqrt{Dd}}{D - d} \times .2618b =$$

hoof ABC ,

$$\frac{D\sqrt{Dd} - d^2}{D - d} \times .2618db = \frac{Dd\sqrt{Dd} - d^3}{D - d} \times .2618b =$$

hoof ADC ,

$$\text{the diff. } \frac{D^3 - 2Dd\sqrt{Dd} + d^3}{D - d} \times .2618b = \frac{D^{\frac{3}{2}} - d^{\frac{3}{2}}}{D - d}^2 \times$$

$.2618b$, is the difference between the two hoofs, expressed by
a new and general theorem; which, when $D = 38$, $d = 31\frac{1}{4}$,
and $b = 40$, gives 5502.54 cubic inches, or 23.82 wine gal-
lons, the difference of the two shares, the value of which, at
 $14d.$ a gallon, is $\pounds 1. 7s. 9\frac{1}{2}d.$

Mr. John Griffith says, "I content myself with referring
every young student to Dr. Hutton's Mensuration, by which
he will find the answer to be 23.82 wine gallons. If I had
procured that book a few years before I did, it would have
profited me more than books of five times its price."

Ingenious solutions were also given by Messieurs James Adams, W. Bearcroft, Sam. Beafall, T. Bournley, A. Buchanan, W. Burdon, Ra. Burton, P. Charlton, Wm. Cook, Chr. Cox, John Craggs, John Cunningham, James Dale, Jos. Dale, Fidelio, Jos. Garnett, A. Glendenning, Geo. Greaves, Ol. Gregory, T. Hartley, John Haycock, J. Holt, Jonathan Hornby, Wm. Larus, John Liddell, Miss Nancy Mason, Tho. Milner, Mich. Mooney, Rd. Nicolson, Geo. Roberts, Ruricola, Ra. Simpson, Tho. Skearratt, Wm. Swann, Wm. Walton, Jonas Weleb, J. Whitcombe, T. Whiting, Wittonensis, S. Woolcott, and John Youart.

V. QUESTION 17, answered by Mr. Jonathan Hornby, Westerdale.

Let C be the centre of the polygon, A B one of its sides, and A C or B C the radius of the circumscribing circle. Then the area of the triangle A B C will be equal $\frac{46 \cdot 25}{13}$
 $= 3 \cdot 5577$ square chains $= a$.



The angle $C = \frac{360}{13} = 27^\circ 41' 32'' \frac{4}{13}$, whose sine put $= s$, the angle A or B = half the supplement of C, $= 76^\circ 9' 13'' \frac{1}{13}$, whose sine put $= c$; also $r =$ A C or B C the radius of the circumscribed circle. Then, by rule 2, p. 96, Hutton's Mensuration, improved edit. $sr^2 = 2a$, and hence $r = \sqrt{\frac{2a}{s}} = 3 \cdot 913$ chains or 391.3 links, the radius of the circle; also as $c : r :: s : AB - \frac{sr}{c} = \frac{s}{c} \sqrt{\frac{2a}{s}} = 1 \cdot 873$ chains, or 187.3 links, the side of the polygon sought.

The same, by Mr. J. Holt, of Manchester.

If lines be drawn from the centre of the polygon to each of the corners, then will the polygon be divided into 13 equal isosceles triangles, the area of each being $\frac{7 \cdot 4^\circ}{13} = 56 \frac{1}{13}$ perches, and the angle included between the equal sides $\frac{360^\circ}{13} = 27^\circ 41' \frac{7}{13}$, and $90^\circ - \frac{1}{2}$ of $27^\circ 41' \frac{7}{13} = 76^\circ 9' \frac{3}{13}$ one of the other angles; the natural sine of which is .464723; but $\frac{464 \cdot 723}{2} \times$ sq. of one of the equal sides of this triangle is

$= 56\frac{1}{3}$, conseq. $\sqrt{\frac{113\frac{1}{3}}{464723}} = 15.6524$ the radius of the circumscribing circle; and as $\sin. 76^\circ 9' \frac{3}{3} : \sin. 27^\circ 41' \frac{7}{3} :: 15.6524 : 7.49173$ perches, one of the sides of the polygon.

Many correspondents remark that the general method of making out the areas of such polygons, may be seen in Hutton's Mensuration, in the Scholium p. 113, &c. new edition, where it is shewn that $\frac{1}{4}t$ denotes one of the triangles, and, $\frac{1}{4}nt$ all the triangles or the polygon, when the side is 1, the number of sides n , and t the tangent of the angle A or B; and consequently $\frac{1}{4}nt^2$ is the whole area of any other similar polygon, whose side is s .

Various other ingenious solutions were given by Messieurs James Adams, Wm. Askton, W. Bearcroft, John Birch, T. Bournley, A. Buchanan, Tho. Bulmer, Wm. Burdon, Ra. Burton, P. Charlton, Wm. Cook, Chris. Cox, John Craggs, John Cunningham, James Dale, Rob. Dowden, John Elliott, Fidelio, Jos. Garnett, A. Glendenning, Geo. Greaves, Ol. Gregory, John Griffiths, T. H, J. Hartley, John Haycock, Wm. Laws, John Liddell, Miss Nancy Mason, Tho. Milner, Mich. Mooney, R. Mountjoy, Cha. Nichols, Rd. Nisbolsen, Norwichiensis, Geo. Roberts, Ra. Simpson, Tho. Skearratt, Wm. Swarn, Wm. Walton, J. Whitcombe, T. Whiting, Rob. Wilkinson, Wittenens, S. Woolcott, and John Yowart.

VI. QUESTION 18, answered, by Mr. Wm. Pearson, North Shields.

This question is a particular case of prob. 1. Hutton's Mathematical Miscellany, where the exhausting of vessels is elegantly treated of. I shall here use the same symbols of notation as in that work, viz. $m = 32\frac{1}{6}$ feet, the depth $x = 9$ inches $= \frac{3}{4}$ of a foot, $z = 19 \times 15 = 285$ feet the area of the descending surface, and $n =$ the area of the aperture sought; then, by that problem, the time of emptying any prism is

$$\frac{2z}{n} \sqrt{\frac{x}{m}} = 15' \text{ or } 900'' = a \text{ by the question; hence } n =$$

$$\frac{2z}{a} \sqrt{\frac{x}{m}} = .09670575 \text{ square feet} = 13.92587 \text{ square in-}$$

ches; and the diameter of this circular area is $\sqrt{\frac{13.92587}{.7854}} = 4.2108$ in hes.

Mr. Tho. Leybourn, after giving the solution much in the same way, adds as follows: If the velocity had been such as a heavy body acquires by falling through the whole height of the water, which is the true velocity of it, the half height

being only used for small holes, on account of the obstruction the water meets with from the edges of the hole, from the obliquity of its motion to enter the hole, and from the obstruction of the parts of the water among themselves, from which causes it happens that less water runs out nearly in the proportion of $\sqrt{1}$ to $\sqrt{\frac{1}{2}}$ or $\sqrt{2}$ to $\sqrt{1}$, which comes to the same thing, as supposing the mean velocity of the water through the whole area of the hole, to be such as is acquired by the descent of gravity down only half its height; I say, supposing the velocity to be that which is due to the whole height, then the general solution may be seen in Dr. Hutton's Select Exercises, p. 209, by which it appears that the time of exhausting is less than in the former case, in the same ratio, viz. that of $\sqrt{2}$ to $\sqrt{1}$; consequently the area n of the hole will be less also in the same ratio, and therefore the diameter of the hole will be less in the ratio of $\sqrt[4]{2}$ to 1, which reduces it from 4.2108 to 3.5406 inches.

The same, by Norwichiensis.

It is proved by the writers on fluids, that the time of emptying a prism by a hole in the bottom, is double to that which an equal quantity would flow through the hole supposing the vessel always kept full by an external supply. Now, the length of the cooler being 19 feet = 228 inches, and the breadth 15 feet = 180 inches, and depth 9 inches, the content is $228 \times 180 \times 9 = 369360 = a$; also let $s = 16 \frac{1}{2}$ feet = 193 inches, $p = .7854$, $b = 7 \frac{1}{2}$ min. = 450", $d = 9$ inches, and x the diameter of the hole; then will $px^2 = \frac{a}{b\sqrt{2sd}}$, whence $x = \sqrt{\frac{a}{bp\sqrt{2sd}}} = 4.2108$ inches, the diameter of the hole.

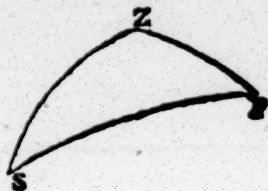
Ingenious solutions were also given by Messieurs, Adams, Bearcroft, Birch, Bournley, Buchanan, Bulmer, Burdon, Charlton, Cook, Cox, Craggs, Dale, Dowden, Fidelity, Garnett, Glendenning, Greaves, Griffith, T. H, Haycock, Holt, Hornby, Larus, Liddell, Mooney, Nicholson, Simpson, Walton, Whitcombe, Whiting, Wilkinson, Wittenens, and Woolcott.

VII. QUESTION 19, answered by Mr. A. Buchanan, Sedgefield.

First as $34 : 24 :: \text{rad. } 1 : .7058823$ the tang. of $35^\circ 13' 3''$ the apparent altitude of the sun's upper limb, to which altitude answers the refraction $1' 20''$, and at the given time the sun's semi-diameter was $16' 0''$, the sum of these is $17' 20''$, from which take $7''$ the sun's parallax in altitude, and there re-

mains $17^{\circ} 13''$, which taken from $35^{\circ} 13' 3''$, leaves $34^{\circ} 55' 50''$, the true altitude of the sun's centre.

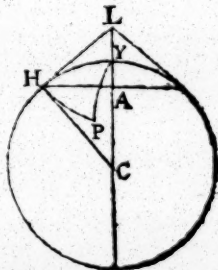
Then in the spherical triangle ZPS , where Z is the zenith, S the sun's place, and P the north pole, there are given the three sides, to find the angle of time at the pole P , viz. $ZP = 36^{\circ} 1'$ the co-latitude $ZS = 55^{\circ} 4' 10''$ the co-altitude, and $PS = 82^{\circ} 37' 8''$ the co-declination; from which is found the angle of time $P = 36^{\circ} 30' 58''$, answering to 2 h. 26 m. 4 s.; so that the clock was 26 m. 4 s. too fast for apparent time.



Nearly in the same manner was the solution given by Messieurs Adams, Abston, Bearcroft, Birch, Bournly, Bulmer, Burden, Burton, Charlton, Cook, Cox, Craggs, Crosby, Dale, Dowden, Evans, Fidelio, Garnett, Glendenning, Greaves, Griffiths, T. H. Hartley, Haycock, Holt, Hornby, Laws, Leybourn, Liddell, Milner, Mooney, Mountjoy, Nichols, Nicholson, Pearson, Simpson, Walton, Whitcombe, Whiting, Wilkinson, Wittonensis, Woolcott, and Youart.

VIII. QUESTION 20, answered by Mr. John Liddell, of Habton.

Let Y denote York, H Hull or Kingston, P the pole of the earth, and L the situation of Lunardi over the city of York. Then, in the spherical triangle PHY , there are given the two sides PH , PY , and the contained angle at P , to find the third side HY the distance on a great circle between York and Hull; viz. given



$PH = 36^{\circ} 10'$ the co-latitude of Hull,

$PY = 36^{\circ} 1'$ the co-latitude of York,

$\angle P = 38^{\circ} 40''$ their difference of longitude;

hence, by Dr. Hutton's Mathematical Tables, p. 167, prob. 1, the versed sine HY , to radius 1 is .0000220, which answers to $23'$, being the arc HY . This tabular versed sine being multiplied by the earth's radius $3978\frac{1}{2}$, gives .0875 or $\frac{7}{80}$ for the line AY . Then, by p. 199, Hutton's Mensuration, 2d. ed. $2CY \times AY \times 3.14159$, &c. = $2187\frac{1}{2}$ square miles, the area of the segment viewed from L , the place of the balloon; which multiplied by 640 gives exactly 1400000 the same area in acres.

The same, answered by Mr. Geo. Greaves, at Mr. Allison's Academy, Kirkdeighton, Yorkshire.

Drawing the scheme as before represented, you have in the spherical triangle PHY, the side PY = $36^{\circ} 1'$, the colat. of York, PH = $36^{\circ} 10'$ the colat. of Hull, and angle P = $38^{\circ} 40''$ the difference of their longitudes; to find HY = $24'$. Then say, as cos. $\angle C : CH :: \text{radius} : CL$, or as radius : CH :: sec. $\angle C$ or HY : CL
 $= 3978.972$; from which take
 the radius . . . CY = 3978.875

leaves YL = $.097$ of a mile = 171 yards, the height Lunardi rose. Then, by similar triangles, as CL : CH :: CH : CA = 3978.778 ;
 this taken from CY = 3978.875 ,

leaves AY = $.097$, which is the same as YL. Then this multiplied by 25000, the circumference of the earth, gives . . . 24250 square miles,
 or 1552000 acres, the surface in view.

Nearly in the same manner was the solution also given by Messieurs Adams, Bearcroft, Bournly, Buchanan, Bulmer, Burdon, Charlton, Cook, Cox, Craggs, Dale, Dowden, Elliott, Fidelio, Garnett, Glendenning, Griffith, Hartley, Haycock, Holt, Hornby, Laws, Leybourn, Milner, Mooney, Mountjoy, Nicholson, Pearson, Simpson, Walton, Whitcombe, Whitting, Wilkinson, Wittonensis, and Woolcott.

ANSWERS to QUESTIONS in the last DIARY.

I. QUESTION 924, answered by Mr. W. Pearson, North Shields.

From the third equation, it is easily seen that neither x , y , or z must exceed 20, therefore suppose $x = 20$; then by the second equation, $y^2 + z^2 = 465 - x^2 = 65$; now if $y^2 = 64$, z^2 will be equal to 1; therefore $y = 8$, and $z = 1$, which numbers answer all the conditions of the equations; but as x , y , and z , are all alike concerned in the equations, any one of the three letters may be any one of the three numbers 1, 8, 20, as these three numbers are the values of the letters, x , y , z .

II. QUESTION 925, answered by Mr. Jos. Garnett, at Mr. Rodham's Academy, Yorkshire.

Putting each side of the given equation = n , by involution, the equations become $x^2 + y^2 = n^2$, and $x^2 - y^2 = n^3$;

whence $x = n\sqrt{\frac{1+n}{2}}$, and $y = n\sqrt{\frac{1-n}{2}}$, where it is evident both the quantities under the radical signs must be square numbers. Therefore, for n substituting $2z^2 - 4z + 1$, the first becomes $z^2 - 2z + 1$, which is a square; and the second becomes $2z - z^2$, which put equal any

square, as $a^2 z^2$, whence $z = \frac{2}{a^2 + 1}$, and $n =$

$$\frac{a^2 - 1}{a^2 + 1} \cdot \text{consequently,}$$

$$x = \frac{a^2 + 1}{a^2 + 1} \times \frac{a^2 - 1}{a^2 + 1}, \text{ and } y = \frac{a^2 + 1}{a^2 + 1} \times$$

$2a$, where a may be any number whatever. And hence,

When $a = 0; 1; 2; 3; 4; 5; \&c.$

then $x = 1; 0; -\frac{2}{5}; +\frac{2}{5}; \frac{24}{49}; \frac{142}{2197}; \&c.$

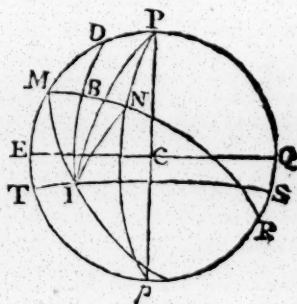
and $y = 0; -1; -\frac{2}{5}; +\frac{2}{5}; \frac{12}{49}; \frac{5}{2197}; \&c.$

IV. QUESTION 927 answered.

This question has been answered on several and various principles, first by spherical triangles and projection, secondly, by Mercator's sailing, thirdly, by plane sailing and plane triangles, which comes near the truth, as well as by approximation by double position. And a specimen of the chief of those methods is as below.

First, *By Spherics, by Mr. Geo. Barnes, of Wigton.*

PROJECTION. Draw the primitive circle $PEPQ$, let EQ be the equator, and Pp the poles of the earth, draw the great circle PNp making the angle $EPp = 50^\circ$ the difference of longitude of the 2 ports, then make $PM = 60^\circ$, and $PN = 50^\circ$, so shall M and N be the two ports, through which draw the great circle MNR , and bisect MN in B with the perpendicular



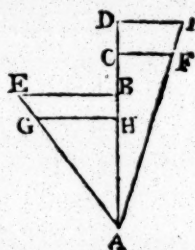
DBI , cutting the parallel TIS of 18° in I , which will be the place of the island; because $MB = BN$ per const. and BI being common, therefore $MI = NI$, the angles at B being right ones.

CALCUL. In the triangle MPN are given $PM = 60^\circ$, $PN = 50^\circ$, and the $\angle MPN = 50^\circ$, to find $MN = 41^\circ 36'$, with the $\angle PMN = 62^\circ 6'$, and $PNM = 87^\circ 45'$; then in the right angled triangle MDB there are given $MB = \frac{1}{2} MN$, and the $\angle DMB$, to find $MD = 39^\circ 4'$, $DB = 33^\circ 51'$, and the $\angle MDB = 34^\circ 18'$; then in the triangle DPI are given $DP = PM - DM = 20^\circ 56'$, and $PI = 108^\circ$, also $\angle IDP = 180 - MDB$, to find $DI = 90^\circ 50'$, and the $\angle DPI = 36^\circ 20'$ the difference of longitude between M and I ; whence $BI = DI - DB = 56^\circ 59'$; then in the right angled triangle MBI or NBI , are given MB or NB , and BI , to find $\angle IMB$ or $INB = 77^\circ$, the side $IN = IM = 59^\circ 22'$ the distance of the island from the two ports, with the $\angle s IMB + DMB = 139^\circ 6'$, and $PNM + INB = 164^\circ 45'$ the bearing of the island from the ports.

Second, *According to Mercator's Sailing, by Mr. John Cullyer, of Wicklerwood, Norfolk.*

Let AD represent the meridian of the island A in 18° south latitude, F and G the ports in 40 and 30 degrees north latitude. Put $AB = 2986 = a$ the meridional difference of latitude of the port G , its proper difference of latitude $AH = 2880 = b$, $AD = 3720 = c$ the meridional diff. of lat. of the port F , its proper difference of latitude $AC = 3480 = d$, and $EB + DI = 3000 = e$ the difference of longitude of the two ports; also put $EB = x$. Then as $AB : EB :: AH : GH = \frac{bx}{a}$; and as $AD : DI :: AC : CF = \frac{de - dx}{c}$; but by the question $AH^2 + GH^2 = AG^2 = AF^2 = AC^2 + CF^2$, that is, $b^2 + \frac{b^2 x^2}{a^2} = d^2 + \frac{de - dx}{c}$, a quadratic equation, in which the value of x comes out 2177.

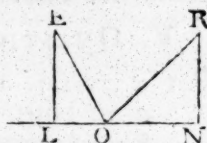
Hence $GH = \frac{bx}{a} = 2100$, and $AG = \sqrt{AH^2 + GH^2} = 3564$ miles $= AF$ the distance from the island to either port; and by trigonometry the angle or course $GAH = 36^\circ 6'$, and the other course or angle $CAF = 12^\circ 28'$.



ton's Diarian Miscellany, vol. i. p. 216, nearly to the following effect. Because the velocities of falling bodies are as the roots of the spaces fallen, and that bodies fall $16\frac{1}{2}$ feet in the first second of time, and thereby acquire a velocity of $2 \times 16\frac{1}{2}$ or $32\frac{1}{2}$ feet per second, it will be as $\sqrt{16\frac{1}{2}} : \sqrt{20}$ (the height of the water) : : $32\frac{1}{2} : \sqrt{80 \times 16\frac{1}{2}}$ = the constant velocity per second of the issuing water, or the length of the cylinder run out in 1 second, whose base is $4^2 \times .7854$ inches or $\frac{.7854}{9}$ square feet; therefore $\sqrt{80 \times 16\frac{1}{2}} \times \frac{.7854}{9} \times 60 = 187.8$ cubic feet, or 1150.8 ale gallons, is the quantity constantly running out in each minute.

VII. QUESTION 930, answered by *Amicus*.

If, to make the question consistent, 3h. 2m. be put instead of 32', from the rising R and easting E let fall perpendiculars RN, EL to the equinoctial LON; then as tan. lat. : tan. EL :: 1 : sin. OL, and as cot. lat. : tan. NR = EL :: 1 : sin. ON, therefore compoundedly $\tan^2 EL = \sin. OL \times \sin. ON$ which is given, and LN is given, wherefore, by prob. 30th of Simpson's Algebra, $ON = 30^\circ 40' 8''$, $LO = 14^\circ 49' 52''$, OE the altitude = $24^\circ 37'$, and LOE the latitude = $54^\circ 41'$.



VIII. QUESTION 931, answered by *Mr. John Haycock, of Ware, Herts.*

The solid contents being as the times of consuming or burning them, which is the most natural supposition, let BCIH be the whole candle, in form of a conic frustum, BCED an inch at the smaller end, and FG IH, an inch at the larger, also ABC the part at top to complete the cone, whose height put = x ; then will the height of ADE be $x + 1$, of AFG $x + 14$, and of AHI $x + 15$. And since the contents of similar cones are as the cubes of their heights, the contents will be as follows, viz. of



$$\begin{array}{ll}
 ABC & \text{as } x^3 \\
 ADE & \text{as } \overline{x+1}^3, \\
 AFG & \text{as } \overline{x+14}^3, \\
 AHI & \text{as } \overline{x+15}^3; \text{ also by subtraction,} \\
 BCIH & \text{as } \overline{x+15}^3 - x^3 \quad \text{or } 45x^2 + 675x + 3375,
 \end{array}$$

FGIH as $\overline{x+15}^3 - \overline{x+14}^3$ or $3x^2 + 87x + 631$,
 BCED as $\overline{x+1}^3 - x^3$ or $3x^2 + 3x + 1$,
 FGIH - BCED as - - - - - $84x + 630$,
 then, by the question,

$45x^2 + 675x + 3375 : 84x + 630 :: 9 : \frac{1}{3}$,
 or $15x^2 + 225x + 1125 : 28x + 210 :: 27 : 1$,
 which gives $5x^2 - 177x = 1515$, the root of which is $x = 42.525$.

Hence $84x + 630 : 3x^2 + 3x + 1 :: 20' : \frac{3x^2 + 3x + 1}{84x + 630} \times 20'$
 $= 26'.433$ or $26' 26''$, the time required of burning one inch
 at the smaller end.

IX. QUESTION 932, answered by Mr. John Griffith.

Let the terms be a, b, c, d, \dots, x, v ; and let $v = x + 1$; then $a^2 + b^2 + c^2 + d^2 + \dots + x^2 = \overline{x+1}^2 = x^2 + 2x + 1$, from which equation $x = \frac{a^2 + b^2 + c^2 + \dots - 1}{2}$, where $a, b, c, \&c.$ may be

any given numbers, the sum of whose squares is odd.

Suppose, for example, it were required to find 11 numbers such that the square of the last may be equal to the squares of all the rest; let the first nine be 1, 2, 3, 4, 5, 6, 7, 8, 9; then the 10th term is $\frac{1^2 + 2^2 + 3^2 + \dots - 1}{2} = \frac{285 - 1}{2} = 142$, and the 11th or greatest term is $142 + 1$ or 143.

Again, let 10, 20, 25 be three numbers, out of five, to find the other two; then the 4th number will be $\frac{10^2 + 20^2 + 25^2 - 1}{2} = \frac{100 + 400 + 625 - 1}{2} = \frac{1124}{2} = 562$, and the 5th term 563.

And thus innumerable sets of numbers may be found having the property proposed.

XII. QUESTION 935, answered by Mr. D. Kinnebrook, jun.

Let ADEB represent the arch of the bridge [see the fig. in the Diary] whose radius AC = 10 feet, and DCEF the section of the boat. Put $x = CF$, and $y = FE$; then by the property of the circle $y^2 = 10^2 - x^2$, and by the question

$\frac{169x^2}{3x^2 + 5x + 7} = y^2 = 100 - x^2$, which reduces to $3x^4 + 5x^3 - 124x^2 - 500x - 700 = 0$, and $x = 7.449495$. The value of x being now found, to find the area of the

curve, we have $y \dot{x} = \frac{13x\dot{x}}{\sqrt{3x^2 + 5x + 7}} = \frac{13}{\sqrt{3}} \times$

$\frac{x^2}{\sqrt{x^2 + \frac{5}{3}x + \frac{7}{3}}}$; to find the fluent of this expression, let x be put $= z - \frac{5}{6}$, then it will be transformed to

$$y\dot{x} = \frac{13}{\sqrt{3}} \times \frac{z\dot{z}}{\sqrt{z^2 + \frac{5}{3}z}} - \frac{\frac{5}{6}\dot{z}}{\sqrt{z^2 + \frac{5}{3}z}}, \text{ the fluent of which}$$

$$\text{is } \frac{13}{\sqrt{3}} \times \sqrt{z^2 + \frac{5}{3}z} - \frac{5}{6} \text{ of hyp. log. } z + \sqrt{z^2 + \frac{5}{3}z};$$

but when $x = 0$, or $z = \frac{5}{6}$, this becomes $\frac{13}{6\sqrt{3}} \times$

$$\sqrt{36z^2 + 59} - \sqrt{84} - 5 \times \text{hyp. log. } \frac{6z + \sqrt{36z^2 + 59}}{5 + \sqrt{84}}$$

$=$ (when $z = x + \frac{5}{6} = 8.282828$) 39.217518 , the double of which gives 78.435036 the area of the section D C E F.

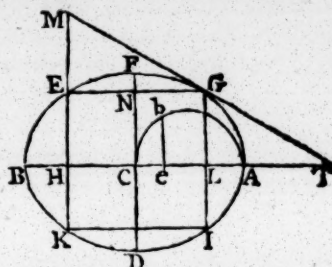
XIII. QUESTION 936, answered by Mr. Tho. White, of Dumfries.

This question requires a perusal of Mr. Flamsteed's precepts. The title of the book is not mentioned; and therefore an absolute solution to the question cannot be expected from a person who has never seen any precepts distinguished by the title of "Mr. Flamsteed's method."* Yet, if the method given by M. de la Caille, at p. 388 of his *Leçons Elementaires d'Astronomie*, be the same as Mr. Flamsteed's, it appears, by art. 1139 p. 391 of the said work, that "the moon's horizontal diameter *must be augmented* according to its approximated *altitude*, in calculating solar eclipses."

* As it is not generally known, this opportunity may be taken to remark, that Flamsteed's method is contained in the last vol. of Sir Jonas Moore's "New System of the Mathematics," viz. in that part of the vol. intitled "The Doctrine of the Sphere;" which part contains a compendious system of astronomical precepts and examples, commonly understood to have been drawn up by Mr. Flamsteed, and presented to his friend and patron Sir Jonas Moore, who had been Surveyor General of his Majesty's Ordnance, and had got the appointment of Astronomer Royal, with the Observatory of Flamsteed House at Greenwich established, for Mr. Flamsteed, who was consequently the first Astronomer Royal of England. — THE EDITOR.

XIV. QUESTION 937, answered by Mr. Geo. Sanderfon.

Let AFB D be the given ellipsis, AB the transverse axe, FD the conjugate, C the centre, A E K the segment, and G E K T the parallelogram, whose sides cut BA in H and L: draw the tangent T G M cutting BA and HE produced in the points T and M.



Now it is manifest that the farther the point G is taken from A, or the nearer to F, the greater will be the subtangent TL. But the parallelogram is to be a max. by the question; wherefore $GE = HL = LT$, and $GL = HE = EM$ (Simpson on the Max. and Min. theor. 8.); but HE cannot be greater than the semibase or ordinate at H; neither can it be less, for then the point G may be taken nearer to the point F, and the subtangent $TL = HL$, or length as well as breadth may be greater; therefore when the length of the greatest parallelogram is a max. $HE = GL$ must be an ordinate at H, or HE must be equal to the semibase of the segment, and $HC = CL$.

By a well known property of the ellipsis, $CL : LA :: BL : LT = HL = 2CL$, therefore $CL : CA - CL :: BC + CL = CA + CL : 2CL$, and $2CL^2 = CA^2 - CL^2$, or $3CL^2 = CA^2 = CB^2$. Whence CL may be easily found either by extracting the root, or by describing a semicircle on CA, and from e , $\frac{1}{3}$ of CA, erect eb perp. to CA meeting the circle in b ; from C apply $CL = Cb$. Then Ce or $\frac{1}{3}CA : Cb :: Cb : CA$; therefore $Cb^2 = CL^2 = \frac{1}{3}AC^2$, and $3CL^2 = CA^2$.

The same, answered algebraically, by Mr. James Dale, at Billingham School.

Put $t =$ semidiameter CA, $c =$ its semiconj. CF, $x =$ CN or LG half the breadth of the parallelogram KG; then, by the nature of the ellipse (Hutton's Conic Sect. prop. 21.) $c^2 : t^2 :: c + x \times c - x : NG^2$, or $c : t ::$

$$\sqrt{c^2 - x^2} : \frac{t}{c} \sqrt{c^2 - x^2} = NG \text{ half the length of the}$$

parallelogram; therefore $\frac{stx}{c} \sqrt{c^2 - x^2}$ is a maximum, where s is the sine of the angle C, or $c^2x^2 - x^4$ a max. which put in fluxions, &c, gives $x = c\sqrt{\frac{1}{2}}$, or $CN = CF\sqrt{\frac{1}{2}}$.

In like manner is $CL = CA \sqrt{\frac{1}{2}}$, or $EG = AB \sqrt{\frac{1}{2}}$. So that, the length EG being in a constant ratio to its parallel diameter AB , the former must be the longest when the latter is so, that is when AB is the transverse axis of the ellipsis. So that the longest of the greatest inscribed parallelograms is that, whose sides are parallel to the two axes, or perpendicular to each other, and that length is $t\sqrt{\frac{1}{2}}$, where t is the transverse axis of the ellipse, or the one to the other as the side of a square is to its diagonal.

XV. OR PRIZE QUESTION 938, answered by Mr. Da. Kinnebrook, Jun.

Let x be any variable space ascended by the cylinder in any time t after the motion is commenced, v its velocity at the end of that time, m and n the specific gravities of water and oak, and $s = 16\frac{1}{2}$ feet. It appears by the principles of hydrostatics, that the absolute weight of the cylinder is to the force of the fluid acting upwards, as the whole cylinder multiplied by its specific gravity, is to the part immersed multiplied by the specific gravity of the fluid, that is as bd^2n to $b - x \cdot d^2n$, and consequently their difference $b - x \cdot d^2n - bd^2n$ will be the force acting upon the cylinder; whence by the laws of motion $bd^2n : b - x \cdot d^2n - bd^2n :: 2s : \frac{2s}{bn} \times mb - mx - nb$ the velocity generated by the said force in one second; and

$$1'' : t \left(\frac{\dot{x}}{v} \right) :: \frac{2s}{bn} \cdot mb - mx - nb : \dot{v}, \text{ therefore } \frac{2s}{bn} \cdot$$

$$mbx - mx^2 - nbx = v\dot{v}, \text{ the fluents of which give } \frac{2s}{bn} \cdot$$

$$ambx - mx^2 - nbx = v^2. \text{ Also } \dot{v} = \frac{\dot{x}}{v} = \frac{\dot{x}}{\sqrt{\frac{2s}{bn} \cdot 2mbx - 2nbx - mx^2}}$$

$$= \frac{\dot{x}}{\sqrt{\frac{m-n}{m} \cdot 2bx - x^2}} \times \sqrt{\frac{bn}{2sm}}, \text{ and the fluent is } t = \sqrt{\frac{bn}{2sm}}$$

\times arc whose versed sine is $\frac{mx}{m-n \cdot b}$ and radius 1, which when x becomes $= p$ is the time required.

COROL. 1. When the forces bd^2n and $\overline{b - x} \cdot d^2m$ become equal to each other, then will $x = \frac{m - n}{m} b$, at which height it is evident the cylinder will float, which will also be the height to which the cylinder ascends before it acquires its greatest velocity.

COROL. 2. The greatest height to which the cylinder will ascend is found by putting v^2 or its equal $\frac{2s}{bn} \cdot \overline{2mbx - 2nbx}$

$-\overline{mx^2} = 0$, whence $x = \frac{m - n}{m} \cdot 2b$, that is double the height at which the cylinder, after an undulatory motion, will settle or float, and the time of ascending the said greatest height is $\sqrt{\frac{bn}{2sm}} \times \text{arc of a semicircle whose radius is 1.}$

The ingenious answers to this question by Mr. George Barnes, and Mr. John Dalton, were inserted in the copy, but obliged to be omitted at the press for want of room.

CORRECTIONS and ADDITIONS to the Solu. of Qu. 917.

1. *By the Rev. Mr. Evans.* "Upon reconsidering question 917, I would wish to correct my solution by observing, that the third way of turning ovals, viz. by the hoop and slider, will form them truly elliptical, because the difference, mentioned in the solution, remains an invariable quantity, as will be evident by attending to the nature of describing an ellipsis by a continual motion. Vid. Emerson's Conics, b. i. pr. 30."

2. *By a Lunarian.* "In answer to question 917, it may be observed, that neither of the methods given in the last Diary is generally practised by the picture-frame makers. They construct two equilateral triangles on the same base; then the angular points of this rhombus are the centres of 4 circular arcs which constitute the circumference of the oval. It is easy to perceive that these arcs, respectively, lie between the sides of the triangles produced. This is the old and common method (which still continues among the workmen) of making an oval. See Clavius's Geom. Also Guldini Centrobaryca, lib. iii. p. 227."

NEW QUESTIONS.

I. QUESTION 21, by *Mr. Tho. Woolsten, Master of the Academy at Adderbury, Oxfordshire.*

Come ye aspiring youths, who learning love,
And would in mathematic arts improve,
Resolve my problem here propos'd below,
And taste those pleasures that from science flow.

On Charwell's fertile banks in Oxfordshire,
Where richest meads in flow'ry pride appear,
A piece of land triangular is found,
Whose area three straight hedges compass round.

The least is 14 chains, and 6 links o'er,

The next is 16 chains, and 44;

ac. r.

And from its area in the margin shewn,

11 1

The base, or longest, may with ease be known :

Likewise the perpendicular I would know,

And difference of the base's segments too.

Enough is giv'n to make the problem clear,

For those who choose to answer it next year.

II. QUESTION 22, by *the Rev. Mr. L. Evans.*

There is an old gentleman in the parish of Fernham, Hants, who has smoaked a pound of tobacco weekly for these 50 years past. Now admitting that the average price of tobacco is 2 shillings a pound, what has his smoaking cost him, reckoning compound interest for his money, at 5 per cent. per annum.

III. QUESTION 23, by *Mr. Ralph Burton, Land-Surveyor, at Salton, Yorkshire.*

Suppose a field in the form of a parallelogram, and consisting of three different qualities, or values, whose lines of partition lie parallel to its ends; let the length of each quality be a, b, c , and the value per acre of each quality d, e, f , respectively: required a general rule for finding the breadth of a quantity which may be worth w , when the same is laid off parallel to the whole length of off side.

IV. QUESTION 24, by *Mr. Tho. Milner, of Catterick.*

A barrel of beer in London is 36 gallons, and the common barrel has 3 in 23 allowed; a barrel in the country is 34 gallons, and the common barrel has $2\frac{1}{2}$ in 23 allowed. Quere how much per cent does the common barrel in London pay less than those in the country.

N. B. This question was first proposed by an excise-officer,

and has been handed about, with the answer 7l. 13s. 3½d. to it, but no other person that I know of has been able to bring out the same answer.

V. QUESTION 25, by *Wittonensis*.

Supposing a hemispherical tea-cup, of four inches diameter, be half full of water; how many guineas, shillings, and sixpences, and of each an equal number, must be put in to make it overflow; supposing the weights of those coins to be as in Hutton's Arithmetic, p. 20, eighth edition, viz. weighing as follows, the guinea 5dwt. 9½gr. the shilling 3dwt. 21gr. and the sixpence 1dwt. 22½gr.; also the cubic inch of standard gold weighing 9.962625 oz., and that of silver 5.556769 ounces?

VI. QUESTION 26, by *Mr. John Jackson, of Hutton-Rudby School*.

On the noon of the 17th of March, I took a straight rod, and setting one end on an horizontal plane, made the other recline from the sun, till I found that its greatest shadow exceeded the length of the rod by 27.8 inches, and at the same time I found that another rod of the same length, set perpendicular to the plane, cast a shadow which exceeded its length by 16.7 inches. I demand the length of the rod, and latitude of the place of observation.

VII. QUESTION 27, by *Mr. John Liddell, of Habton*.

Given the radii, R and r , of the earth and moon, and the distance d of their centres; to find a point in a right line between them, so that they shall both appear of the same bulk or magnitude; by a general theorem that may be applied to the solution of any other question of the like nature.

VIII. OR PRIZE QUESTION 28, by *Mr. E. Warren*. [*Whoever answers it before Candlemas Day, has a chance by lot for ten Supplements.*]

Walking along a level road, I observed a cart at a small distance before me, which made a creaking noise at every revolution of one of the wheels, which was of 5 feet diameter. In 5 minutes I overtook the cart, and continued walking on for 7 minutes longer, when I sat down till the cart came up, which it did in 4 minutes, during which time I counted 17 creaks in 1 minute. From hence I would know the rates and distances gone by myself and the cart, and also the position of the cart when I first observed it, as when I passed it, and sat down.

Of the ECLIPSES, &c. in 1791.

There are only two eclipses that happen in the course of this year, which are both of the sun, but neither of them will be visible ones to the inhabitants of this island; for which reason any types of these eclipses are quite unnecessary this year.

The first of these two eclipses of the sun, happens on Thursday the 22d day of March, at 50 minutes past 5 in the afternoon at Greenwich, or London, and most other parts of the island; but, although the sun is not then set, the eclipse will be invisible to us, and all other parts of Europe, on account of the smallness of the moon's latitude, which is but $3^{\circ}30''$ north at the time of her conjunction with the sun, and therefore her parallax at that time will depress the visible place of her centre by more than the space occupied by the semidiameters of the sun and moon; so that in these latitudes the body of the moon will be seen as depressed quite below that of the sun, and so not causing any eclipse. But it will be a great eclipse in the southern parts of the globe, and in some part of South America it will be both central and annular.

The second eclipse happens on Sunday the 16th day of September at 9h. 18m. in the morning. But this eclipse is also invisible to us, on account of the moon's latitude being south, viz. 1 min. although it falls in the day time, when the sun is visible, and has considerable elevation. But in the heart of Ethiopia, a little north of the equator, this eclipse will be central and annular, making a very beautiful appearance, the breadth of the sun's bright annulus about the rim of the moon being about half a digit.

The circumstances above-mentioned, apply to any other solar eclipses here in England, and other parts of Europe; from whence it happens that no solar eclipses are visible here, when the moon is in south latitude, nor even when in north latitude, unless it be pretty large, so as to counterbalance her parallax, which always depresses her a great quantity south. And this is the chief reason why solar eclipses happen more seldom in any one place than lunar ones, although there are more of the former than the latter, taking in all parts of the globe.

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The account of New Comets is obliged to be postponed for want of room.

F I N I S.

